

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

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Applicant's or agent's file reference P3123 WO ORD		FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/PEA/416)	
International application No. PCT/GB 03/04473	International filing date (day/month/year) 13.10.2003	Priority date (day/month/year) 11.10.2002	
International Patent Classification (IPC) or both national classification and IPC G01R31/26			
Applicant AOTI OPERATING COMPANY, INC. et al			

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.
2. This REPORT consists of a total of 6 sheets, including this cover sheet.

☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:
 - I ☒ Basis of the opinion
 - II ☐ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application

Date of submission of the demand 29.04.2004	Date of completion of this report 17.12.2004
Name and mailing address of the international preliminary examining authority:  European Patent Office - Gitschiner Str. 103 D-10958 Berlin Tel. +49 30 25901 - 0 Fax: +49 30 25901 - 840	Authorized Officer Höller, H Telephone No. +49 30 25901-629 

**INTERNATIONAL PRELIMINARY
EXAMINATION REPORT**

International application No. **PCT/GB 03/04473**

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-21 as originally filed

Claims, Numbers

1-14 as originally filed

Drawings, Sheets

1/7-7/7 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

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5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	6-8,10,14
	No: Claims	1-5,9,11-13
Inventive step (IS)	Yes: Claims	10
	No: Claims	1-9,11-14
Industrial applicability (IA)	Yes: Claims	1-14
	No: Claims	

2. Citations and explanations

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1) Reference is made to the following documents:

D1: XP002270247

D2: XP010316828

2) The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1 and 11 is not new in the sense of Article 33(2) PCT.

2.1) The document **D1** discloses (the references in parentheses applying to this document):

- An instrument for determination of the DC safe area of operation of a semiconductor device-under-test (chapter 1.2 paragraph 2) comprises:

- a first DC biaseer to apply an adjustable DC bias at a first channel of a device-under-test (chapter 1.2 paragraph 3 and chapter 3.2.1 paragraph 1)
- a means to apply a bias signal at a second channel of a device-under-test (chapter 3.2.1 paragraph 1)

which means comprises:

- a second DC biaseer to apply a DC bias at a bias point within the safe operating limit (chapter 3.2.1 paragraph 1 and chapter 1.2 paragraph 3)
- a variable biaseer subsequently to apply a variable stimulus comprising fast superimposed rectangular bipolar pulses (chapter 1.3.2)
- wherein the instrument further comprises means to measure the current response thereto so as to permit extrapolation of a detailed I-V response in the vicinity of the safe operating limit (chapter 1.3.1 paragraph 2; figures 2.2, 2.3 of chapter 2.5.2 and chapter 2.5.2)

Therefore the subject-matter of **claim 1** is considered not new.

2.2) The document **D1** also discloses (the references in parentheses applying to this document):

- A method for determination of the DC safe area of operation of a

semiconductor device-under-test (chapter 1.2 paragraph 2 and chapter 1.3 paragraph 1)
comprising the steps of:

- applying a DC bias at a first channel such as the input of the device-under-test (chapter 3.2.1 paragraph 1)
- applying a DC bias at a second channel such as the output of the device-under-test at a bias point base level within the safe operating limit of the device-under-test (chapter 3.2.1 paragraph 1 and chapter 1.2 paragraph 3 as under DC (quiescent) bias the device is not stressed)
- applying a variable stimulus at the second channel comprising superimposed fast rectangular bipolar pulses (chapter 1.3.2)
- rapidly measuring the current response thereto at both the channels (chapter 1.3.2 paragraphs 5-6)
- extrapolating from the responses a detailed I-V response for the device in the vicinity of the safe operating limit (figures 2.2, 2.3 of chapter 2.5.2 and chapter 2.5.2)

Therefore the subject-matter of **claim 11** is considered not new.

3) Dependent claims 2-9 and 12-14 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and/or inventive step, the reasons being as follows:

- 3.1) The additional feature, concerning the pulses with progressively increasing amplitudes, as claimed in **claims 2 and 12** is known from **D1**: (see chapter 1.3.2 paragraph 3 and chapter 2.5.2 paragraph 3), Article 33(2).
- 3.2) The additional feature, concerning the critically damped pulsed wave form of minimum rise time, as claimed in **claim 3** is known from **D1**: (as the pulse width could be very short (see "Pulse timing specifications" in chapter 7.1.1) and the measurements are made during the interval of this pulse a minimum rise time is required), Article 33(2).
- 3.3) The additional feature, concerning the pulse length being below about one μ s or 100ns, as claimed in **claims 4 and 5** is known from **D1**: (see "Pulse timing specifications" in chapter 7.1.1), Article 33(2).

- 3.4) The additional feature, concerning the high stability voltage source being serially connected via a resistor, as claimed in **claim 6** can not be considered as involving an inventive step as the voltage source in **D1** has to be highly stable to achieve the pulse specifications and impedance matching using resistors is a general practice, Article 33(3).
- 3.5) The additional feature, concerning the low pass filter and the forming of the low pass filter by inductors and shunt capacitors, as claimed in **claims 7 and 8** is known from another document of the same instrument (see **D2** Figure 2), Article 33(3).
- 3.6) The additional feature, concerning the remote head including the response measuring means, as claimed in **claim 9** is known from **D1**: (see Figure 1.2 in chapter 1.3.2), Article 33(2).
- 3.7) The additional feature, concerning the repeated performance of applying voltages, making measurements and increasing pulse amplitudes, as claimed in **claim 13** is known from **D1**: (see figures 2.2, 2.3 in chapter 2.5.2 and chapter 2.5.2), Article 33(2).
- 3.8) The additional feature, concerning the method used for the accurate characterisation of a breakdown point, as claimed in **claim 14** can not be considered as involving an inventive step as this iterative approach is merely one of several straightforward possibilities from which the skilled person would select, in accordance with circumstances, without the exercise of inventive skill, in order to solve the problem posed, Article 33(3).
- 4) The combination of the features of dependent **claim 10** is neither known from, nor rendered obvious by, the available prior art as no indication neither in **D1** nor in **D2** is given to include the means to generate the superimposed fast, generally rectangular, synchronous bipolar pulses into the remote head: